ABSTRACT:

Background:

Magnesium, the second most abundant intracellular cation plays a significant role in glucose homeostasis and insulin resistance. Magnesium deficiency is associated with insulin resistance and development of diabetes mellitus.

Objective:

The primary objective of the study is to determine whether overweight and obese children have low serum magnesium and the secondary objective is to correlate magnesium with degree of adiposity (Body mass index) and indices of insulin sensitivity(HOMA-IR, QUICKI, FGIR.)

Materials and methods:

Study was carried out in the paediatric endocrine division of Institute of child health and hospital for children, Chennai. Study included 56 children aged 5-12 years who belong to either overweight or obese category as per IAP growth charts 2015 as cases and 56 age matched lean children as controls. Serum cholesterol, serum triglycerides, serum HDL, serum electrolytes, liver enzymes, fasting glucose, fasting insulin, serum magnesium and indices of insulin sensitivity were measured in both groups.

Results:

The mean serum magnesium (mg/dl) were significantly lower in the cases (2.04±0.23) when compared to controls(2.29±0.15) p=<0.001.Serum magnesium showed inverse correlation with BMI, fasting insulin, HOMA-IR and positive correlation with QUICKI and FGIR. Intra group comparison between 43 obese and 13 overweight subjects showed statistical significance for serum magnesium (obese 2.00±0.24 and overweight 2.18±0.075) p=<0.001

Conclusion:

Serum magnesium levels are low in overweight and obese children when compared to controls. There is an inverse correlation between magnesium with BMI, fasting insulin, HOMA-IR and positive correlation between magnesium with QUICKI and FGIR.

Keywords: obesity, BMI, insulin resistance, magnesium